UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,090	07/31/2003	William B. Boyle	K35A1324	3202

				EXAMINER
35219	7590	09/26/2006		KO, DANIEL BOKMIN

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ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/633,090	BOYLE, WILLIAM B.
	Examiner	Art Unit	
	Daniel B. Ko	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

This action is responsive to the Amendment filed on 7/10/2006.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   Claims 1-3, 7, 9-11, and 15 are rejected under 35 U.S.C. 102(b) as being

anticipated by Arimilli et al. (U.S. Patent 6,418,516), hereinafter simply Arimilli.

Regarding claims 1 and 9, Arimilli teaches a disk drive control system comprising

a micro-controller, a micro-controller cache system having a cache memory and a

cache-control subsystem, and a buffer manager communicating with the micro-

controller cache system and a remote memory, a method for improving fetch operations

between the micro-controller and the remote memory via the buffer manager, the

method comprising:

receiving a data-request from the micro-controller in the cache control subsystem

wherein the data-request comprises a request for at least one of an instruction code and

non-instruction data (Fig. 6, step 350; column 8, lines 55-62; column 10, lines 66-67);

providing the requested data to the micro-controller if the requested data reside

in the cache memory (Fig. 6, step 368; column 11, lines 8-9); and

if the requested data does not reside in the cache memory;

determining if the received data-request is for a non-instruction data (Fig. 6, step 356 and step 358; column 11, lines 4-6; Arimilli discloses the upper level cache and the lower level cache, the cache memory in the claim is equivalent to upper level cache in this case, because the upper level cache is faster than the lower level cache);

fetching the non-instruction data from the remote memory by the micro-controller cache system via the buffer manager (Fig. 6, step 358 and step 362; column 11, lines 4-6; Arimilli's lower level cache is equivalent to the buffer manager in this case, because the lower level cache is slower than the upper level cache); and

providing the fetched non-instruction data to the micro-controller without caching the fetched non-instruction data (Fig. 6, step 356 and step 358; column 11, lines 4-8; Arimilli discloses the upper level cache and the lower level cache, the cache memory in the claim is equivalent to the upper level cache in this case, because the upper level cache is faster than the lower level cache).

According to claims 1 and 7, if the requested data is non-instruction data and not reside in the cache then the non-instruction data should bypass the instruction cache memory (See figure 7). Non-instruction data isn't stored to an instruction cache memory. Therefore, Applicant's claimed invention works like instruction cache.

Regarding claims 2 and 10, Arimilli teaches a method, wherein determining is based on a signal received from the micro-controller (column 8, lines 66-67).

Regarding claims 3 and 11, Arimilli teaches a method wherein fetching further

comprises:

transmitting a cache control subsystem data-request from the cache control

subsystem to the buffer manager; accessing the remote memory by the buffer manager;

and retrieving the cache control subsystem requested data from the remote memory

(column 10, lines 66-67; column 11, lines 1-15; column 11, lines 55-67; Arimillli

discloses the lower level storage may be a DASD or planar dynamic memory or L2

cache. So, it is clear that lower level storage could be the buffer).

Regarding claims 7 and 15, Arimilli teaches a method, further comprising:

if the requested data does not reside in the cache memory:

determining if the received data-request is for an instruction code; and

filling the cache memory if the received data-request is for an instruction code

(Fig. 6, step 356 and step 366; column 11, lines 9-11).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

2.   Claims 4-6, 8, 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Arimilli et al. (U.S. Patent 6,418,516 B1), hereinafter simply Arimilli, in

view of Henson et al. (US Patent Application 2002/0065994 A1), hereinafter simply

Henson.

Regarding claims 4 and 12, Arimilli teaches the limitations of the claim 1 above.

However, Arimilli fails to teach the buffer manager is in communication with a plurality of

control system clients and provides client-requested data to the clients from the remote

memory. Henson teaches a method, wherein the buffer manager is in communication

with a plurality of control system clients and provides client-requested data to the clients

from the remote memory (page 1, paragraph 6). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine Arimilli with Henson. The motivation for doing so would have been an efficient and effective arbitrating among competing clients seeking access to a shared memory array within the embedded controller of a hard disk drive (page 2, paragraph 15).

Regarding claims 5 and 13, Henson teaches a method, wherein the plurality of control system clients comprises at least one of a disk subsystem (page 2, paragraph 27), an error correction code subsystem (page 2, paragraph 29), and a host interface subsystem (page 3, paragraph 30).

Regarding claims 6 and 14, Henson teaches a method, wherein the remote memory comprises a dynamic random access memory (DRAM) (page 1, paragraph 6).

Regarding claims 8 and 16, a burst fill of the cache memory is obvious feature and well known in the art. Loading instructions from external memory into an on-chip cache helps ensure that instructions will be available to the CPU at clock speeds. It helps cut power requirements, because several instructions can be loaded into cache at the same time, and the CPU does not have to access memory for each instruction.

Response to Arguments

Applicant's arguments filed 7/10/2006 have been fully considered but they are

not persuasive.

Claims 1-3, 7, 9-11 and 15

Regarding claims 1-3, 7, 9-11, and 15, on page 6, fourth paragraph, Applicant

argues that Arimilli does not teach "providing the fetched non-instruction data to the

microprocessor without caching the fetched non-instruction data."

In response, it is noted that Arimilli teaches an operand data requests out of the

upper level cache (column 11, lines 4-8).   Also, if the requested data is non-instruction

data and not reside in the cache then the non-instruction data should bypass the

instruction cache memory (See figure 7) and providing the non-instruction data without

caching the non-instruction data. Non-instruction data isn't stored to an instruction

cache memory. Therefore, Applicant's claimed invention works like instruction cache.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

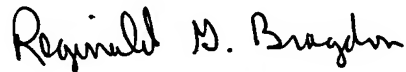examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Reginald G. Bragdon can be reached on 571-272-4204. The fax phone

number for the organization where this application or proceeding is assigned is 703-

273-8300.

Information regarding the status of an application may be obtained from the
Patent Application Information Retrieval (PAIR) system. Status information for
published applications may be obtained from either Private PAIR or Public PAIR.
Status information for unpublished applications is available through Private PAIR only.
For more information about the PAIR system, see http://pair-direct.uspto.gov. Should
you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).

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